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AGRICULTURAL NEWS LETTER

VOL. 11 - NO. 2 MARCH-APRIL, 1943

This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations of the du Pont Company and its subsidiary companies. It also contains published reports and direct contributions of investigators of agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.

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CHEMICAL PRODUCTS ARE AMONG IMPORTANT AGRICULTURAL RESOURCES FOR 1943

"No one in the United States will go hungry,
but the fighting men will come first!"

Chemistry and the products of chemical research -- both old and new -- are counted on to help make good this promise of the United States government.

Such products as fertilizers, insecticides and fungicides for crops, and feeds and medicaments for livestock and poultry, have and will continue -- at an accelerated pace, wherever possible -- to help make every acre of land and every man-hour of labor produce more and better crops "to win the war and write the peace."

While the situation changes from day to day, growers of farm crops are being assured that reasonably adequate supplies of such important agricultural resources as fertilizers and insecticides will be made available to them for the 1943 crop season.

Seed and Seed Disinfectants -- Without adequate quantities of disease-free seed of high germinating quality, properly planted at the right time of the year, applications of fertilizers and insecticides are useless. With the tremendous yields of crops in 1942, production of seeds of all kinds in this country was greater than ever.

The government has been carefully watching the seed supply situation to make sure enough is retained in this country for our own food production. Therefore, despite heavy exports of seed to England, Russia, Australia, and our other Allies, there will not be any general seed scarcity in the United States in 1943.

All seed distributed by commercial seed houses is not only produced under controlled conditions to assure varietal trueness, but it is also tested for germination. Farmers are urged to use the available chemical seed disinfectants to treat their seed, or to make sure the seed has been treated against more than 500 different disease organisms or germs which are carried on farm and truck crop seeds.

"Semesan" seed disinfectant, for instance, will assist in destroying many of the fungous and bacterial organisms found on vegetable and other seeds and in the soil, giving protection against costly losses from such diseases as damping off, and from seed decay.

With every acre being called upon to yield its maximum, use of seed disinfectants is essential to success in growing crops for the war effort. Preventable losses from plant diseases, which average about $200 annually per

Continued on next page

farm, are certainly not justifiable in war times, particularly when adequate supplies of seed disinfectants are assured for the essential farm crops to be grown in 1943.

Fertilizers -- Without adequate amounts of the right kind of chemical fertilizers, many farming operations would be unproductive, and the opportunity to utilize available land for wartime production would be wasted.

Fertilizers produce, on the average, 15 per cent of all our farm crops in normal times, and their effects on maturity and quality are beyond calculation. Fertilizers produce around two-thirds of the tomato crop and three-fourths of the Florida citrus crop.

Most commercial fertilizers contain nitrogen, phosphoric acid, and potash, and sometimes one or more of the so-called minor elements such as magnesium.

A spokesman of the U.S. Bureau of Plant Industry has stated that American farmers will be able to get most of the commercial fertilizer they need to meet 1943 crop production goals, despite the record demand for fertilizers resulting from the great increase in farm income for 1942. He predicted that there would not be enough nitrogen to meet this demand, but there would be enough for what he called essential requirements. Adequate supplies of both phosphoric acid and potash are predicted.

The somewhat reduced supply of chemical nitrogen fertilizer is the result of enormous increases in the use of synthetic ammonia for munitions and other war industries. For instance, such synthetic nitrogen solutions as Du Pont's urea-ammonia liquors, characterized by the government spokesman as "the industry's least expensive source of nitrogen," have largely been taken from fertilizers and diverted to the direct war effort.

The amount of nitrogen imported is contingent on the shipping situation. Consequently, it has become necessary to obtain large amounts of nitrogen for fertilizers from other sources, particularly the natural organics. And, while this situation has been further complicated by diversion by government decree of vegetable oil meals into feed for livestock and away from fertilizers, the government expects nitrogen consumption for fertilizers -- spread over a larger acreage and a greater number of farms -- to be higher than in any year prior to 1941, despite war conditions.

Insecticides and Fungicides -- Reports indicate that there will probably be an adequate supply of most insecticides for the 1943 season. There will be some rather severe shortages in some of the important materials, but expert opinion is that, through substitution and conservation, the needs of agriculture will be met reasonably well.

Arsenicals will be somewhat below 1942, although everything possible is being done by the government to provide crude materials for insecticides. Copper materials will be about equal to 1941. Latest reports indicate supplies of mercury compounds will also be about equal to those of last year.

Continued on next page

Wettable sulfur (for spraying) and dusting sulfur are plentiful, with no restrictions.

Rotenone is decidedly less plentiful, and its use restricted. Cryolite is considerably more plentiful.

Spreaders and stickers should be available in adequate quantities in different forms.

Container problems, especially metal containers, are involved in some products, and transportation may become a limiting factor at the peak of the season, especially on products used in large quantities, such as spray oils and lime-sulfur solutions.

However, both government and industry are doing their best to make certain that the farmers of this country have sufficient total supply of insecticides and fungicides to protect the most important 1943 crops against insect and plant-disease enemies.

Sanitation for Livestock and Poultry -- Veterinarians have expressed fear of greater disease losses in 1943 due to the increased livestock population on farms and the crowding of barns and lots.

Farmers are being urged to take extra precautions, and to act promptly if any livestock diseases threaten or show up in the herd. They are being advised of the newest developments in connection with the effective use of the chemical, phenothiazine, for control of internal parasites of livestock, including destruction of cecal worms in poultry.

These new developments include, for instance, the discovery that fasting of livestock is no longer needed prior to dosing, and that mass treatment, along with ground salt, can be given sheep on pasture.

Sheep and cattle growers, particularly in the South and Southwest, are being given the latest information on the control of screw worm by use of the government's new formula, known as Smear No. 62, made up of diphenylamine, benzol, Turkey red oil, and lampblack.

These various simultaneous treatments of livestock not only save labor, but eliminate the bad effects of unnecessary handling on the animals themselves. Certainly, these and numerous other new chemical aids to veterinary science are valuable contributions to healthy animals and provide more food for our fighters and workers.

Feed for Poultry -- Poultry nutritionists also caution growers not to forget that poultry needs plenty of vitamins, especially during damp, dark, winter and spring months.

Growers are urged to check the vitamin content of all feeds. Vitamins A and D are said to be all-important. In poultry feeds, vitamin A is found in yellow corn, alfalfa, and succulent pasture.

Continued on next page

In feeding for normal growth, vigor, and high egg yields, vitamin D is an essential ingredient in poultry feeds. Vitamin D is available in "Delsterol" "D"-activated animal sterol, manufactured by Du Pont by activating with ultra-violet light the sterols derived from domestic sources which are always available.

That adequate feed is essential to meet the new production quotas of 8 per cent more eggs and 28 per cent more pounds of chicken for meat is shown by hundreds of experiments all over the country. For instance, studies on 120 Arkansas farms show that 3.9 to 4.6 pounds of balanced feed, including vitamin D and other essential ingredients, were required to produce a pound of broiler chicken, and that broilers weighing 4 pounds made a profit while those weighing 2½ pounds showed a loss.

"Delsterol" supplies the all-important vitamin D in a dry form, uniform in potency, and of exceptional stability. Du Pont chemists worked for 10 years to produce this scientifically controlled vitamin D, which offers a solution to an important problem in poultry nutrition -- a solution of more than ordinary value in the production of the tremendous quantities of eggs and chicken and turkey meat in 1943.

Processing and Packaging Farm Products for Export -- The government, realizing that large amounts of food must be exported to feed our Allies and our fighting men all over the world, proposes not only to remove the water but also to squeeze the air out of much of it to save shipping space.

More than 5,000,000 tons of food grown on American farms will be dehydrated and reduced in weight to approximately 500,000 tons, with corresponding reduction in shipping space required.

Compressed into tiny blocks to occupy from 50 to 90 per cent less space, much of this dehydrated food will be further reduced in bulk by a new process which squeezes most of the air out of the dried products. Immediately after the compression, each block of food is wrapped in moistureproof cellophane -- another contribution of chemical research -- which is then sealed with heat. The film is germ-proof and grease-proof, affording maximum protection.

Foods compressed in this way are quickly restored to their original form with hot water, and are similar in appearance and taste to the fresh, raw foods.

A square of compressed potatoes about half the size of a pack of cigarettes is sufficient for two persons. A dozen eggs, dried and compressed, can ride in the cargo space needed for only one egg in the shell. A variety of vegetables has been put into compressed form, and experiments have included puddings, ice cream mixes, flour, and pre-cooked cereals.

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SODIUM FLUOSILICATE AVAILABLE FOR GRASSHOPPER BAIT

Grasshoppers, which destroy an estimated $25,000,000 worth of crops annually, face a chemical foe in 1943 notwithstanding that the government requires for other purposes the sodium arsenite used heretofore to poison the pests. It is sodium fluosilicate (also known as sodium silicofluoride), produced by Du Pont, which meets all government specifications for use in poison baits to save large acreages from depredation this year, when every pound of food is precious.

Sodium fluosilicate is a dry powder much more easily and safely handled and stored than concentrated sodium arsenite solutions commonly employed. It is said to be much more distasteful to farm animals than sodium arsenite, which is quite attractive. However, it is poisonous, and must be handled accordingly.

Samples Sent to State Entomologists In Affected States

Samples of this material have been sent to the entomologists of the states where the grasshoppers do most damage, so that the control authorities will know where to obtain the material should outbreaks threaten.

Grasshoppers usually do most damage in Arkansas, Arizona, California, Colorado, Idaho, Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, New Mexico, Nevada, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, Wisconsin, and Wyoming -- generally referred to as the North Central, Rocky Mountain, and Southwestern groups of states. However, grasshopper outbreaks may occur in any part of the United States during prolonged drought periods.

In California, for instance, statements show that crops valued at $3,295,925 were saved from destruction by grasshoppers in 1942, bait being applied on farms ranging from a 300,000-acre ranch to small areas of cultivated lands. In Arkansas, it is reported 1,248 farmers in six counties last year spread poison bait on 32,157 acres and otherwise protected 201,348 acres, mostly in soybeans and alfalfa, with a saving estimated at $2,796,310.

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"AGRICULTURAL RESEARCH USEFUL TO OTHER SCIENCES" -- TISDALE

"Often it is necessary to employ the methods of other sciences in our agricultural research," according to Dr. W. H. Tisdale, Director, Du Pont's Pest Control Research Laboratory. "In fact, there is no sharp line of demarcation between the so-called agricultural sciences and sciences such as chemistry, physics, engineering, and mathematics. Many of the fundamental basic principles underlying the advances in agriculture are products of the discoveries of several other sciences. Likewise, the practical solutions of many of our agricultural problems depend on the discoveries of applied research in other sciences, and especially research in the industries. The flow of knowledge and assistance is by no means all in one direction. Much that is accomplished through agricultural research is useful to other sciences."

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WINDOW SHADE MADE FROM COTTON FABRIC IMPREGNATED WITH "LIQUID COTTON"

They cracked! They faded! They ripped!

They sagged! They curled! They tore in the wind!

They gathered dirt! They simply didn't last!

In fact, the "filled" types of window-shade cloth available at the end of the first World War were poor makeshifts at best.

Today, when proper interior shading and lighting are so important in the war production effort, things are different. In 1917, Du Pont chemists undertook to produce a durable, washable window-shade cloth which would be scientifically engineered to control light and glare, and would not have all the weaknesses of the old-type material.

These chemists and engineers used a high-grade cotton fabric as a base. But without a lasting, protective coating, the cotton fabric was inadequate for practical service. After several years of painstaking experiments, they succeeded in making the first satisfactory washable window-shade cloth by impregnating cotton fabric with pyroxylin -- a solution of cotton in nitrated form.

Years of Research Result in Washable, Durable "Tontine"

Thus, "Tontine" pyroxylin-impregnated washable window shade was created by chemistry.

Then came further research, experiments, and tests to evolve a properly balanced formulation of pyroxylin, pigments, softeners, and other ingredients that would impart to shade cloth the maximum in washability and wearability.

All of this research resulted in the various types of "Tontine" used so successfully today in homes, hotels, apartments, offices, hospitals, schoolrooms -- and wherever good window shading is essential.

Pyroxylin -- being insoluble in water and therefore washable -- was the logical corrective for the weaknesses inherent in other types of shade cloths. Because it is "liquid cotton," it has a natural affinity for the cotton base. When impregnated into the very fibers of the fabric, it forms an enduring bond and gives a protective film that renders it proof against cracking or pinholing.

Under the microscope the threads of pyroxylin-treated fabric are shown firmly anchored together by the pigmented pyroxylin. Each thread has taken on an additional substance, and there is no evidence of a filler that simply overlays the fabric. That is why fabric treated with pyroxylin can be scrubbed with a brush, hot water, and soap -- over and over again -- without destroying the finish.

Continued on next page

Colors Range from Blackout Black to Most Delicate of Pastels

"Tontine" is made in many colors, ranging all the way from blackout black and dark green to the most delicate of pastels. Laboratory tests show that the Translucent types admit from 73 to 140 per cent more light than ordinary painted shade cloth, while keeping out the harmful glare.

To insure adequate light in schoolrooms, the legislatures of 36 states have passed laws providing that 25 per cent of the total classroom wall area must be devoted to window openings -- again emphasizing the importance of proper shading. "Tontine" shades can be adjusted to admit enough light to permit both reading and classroom work without eye strain, while at the same time excluding glare.

Similarly, "Tontine" shades can be adjusted to create the most satisfactory lighting arrangements in rooms where essential war work is being done.

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CELLOPHANE ON BAKED BEANS REPLACES METAL

Cellophane is helping to save the day for another farm product -- Boston baked beans, one of America's most popular canned foods.

Because of the tin and steel shortage, baked beans in cans have been ruled out. However, one firm is now supplying baked beans, in quick-frozen form, wrapped in a cellophane bag which is in turn placed inside a cylindrical paperboard container.

The production of the new frozen food is expected to reach a volume of 80,000 pounds a week -- over 2,000 tons a year.

Judging from the favorable reaction, frozen baked beans may remain a popular item after the war. They are easy to open and require only a few minutes heating to prepare for the table.

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BLEACHING ENHANCES APPEARANCE, USEFULNESS AND VALUE OF FARM PRODUCTS

Commercially treated handles on picks, shovels, pitchforks, and other essential farm tools have that blonde look because they were bleached with hydrogen peroxide.

This chemical, commonly associated with bleaching hair, is also used to bleach fiber, food, fur, skins, straw, hair, and oils -- most of which are derived from the products of farm and forest.

Hydrogen Peroxide Now More Than Mere Pharmaceutical or Cosmetic

Chemists and engineers of the Du Pont Electrochemicals Department introduced into this country in 1926 an electrolytic process for manufacturing hydrogen peroxide. Thereafter, the process and the product have been improved, and formulas varied to suit different needs.

The cloth made from the cotton grown on our Southern farms, and woven into soldiers' underwear, shirts, socks, towels, sheets and pillow cases, is a drab gray when it slides from the loom. Hydrogen peroxide bleaching leaves the cloth white, ready for finishing.

Raw wool for uniforms and other military uses is cleaned with this chemical before dyeing.

Many farm-produced foods are bleached with this chemical. It is used with bone charcoal in the clarification of raw sugar. California figs are lightened in color and made more marketable.

Casein, derived from milk, is bleached with hydrogen peroxide for use in light-colored plastic articles.

Cow and goat hair for household items are made light enough to be dyed evenly. Beeswax, too, is made uniform in color for cosmetic use and for ceremonial candles.

Rancid animal oils collected from many sources are bleached, and the rancidity nullified with hydrogen peroxide.

Straw for summer hats is bleached to the desired shade with this chemical. Rabbit fur for felt hats is treated to make the fibers stick together.

Corn starch, now of especial wartime importance as a replacement for unavailable tapioca starch, is treated with hydrogen peroxide to improve its fluidity properties for such uses as paper coatings.

The family doctor and the veterinarian use hydrogen peroxide. When poured on a wound, the chemical breaks down into water and very active oxygen which effectively combats infection. Only last year the chemical was found to be very effective for removal of all species of worm parasites commonly occurring in the intestinal tract of dogs, as discussed on the next page.

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TWO NEW VERMIFUGES FOR DOGS SHOW CONSIDERABLE PROMISE

Hydrogen Peroxide Reported Effective For All Species of Worm Parasites

Hydrogen peroxide, generally used as a bleaching agent, a cosmetic, or a household antiseptic, is now reported "very effective" for removal of all species of worm parasites commonly occurring in the intestinal tract of dogs.

The United States Department of Agriculture "Yearbook," reporting the discovery, emphasizes the fact that heretofore no single drug has been known that would remove tapeworms, hookworms, large roundworms, and whipworms. Information on symptoms, recommended dosages, and methods of administering the hydrogen peroxide should be obtained from a veterinarian or from the U. S. Bureau of Animal Industry, which advises that the treatment must be given with caution.

Experiment Indicates Possibility of Using Diphenylamine to Remove Whipworms

Another experiment is reported indicating the possibility of using diphenylamine, a coal-tar chemical, to remove whipworms from dogs.

The treatment removed 84 per cent of 452 of the 537 whipworms from five dogs. The Bureau states that additional research is needed to standardize the dose and to determine the safety of the drug.

Du Pont chemists point out that diphenylamine is already an important medicament used by veterinarians, large quantities of the chemical being used to destroy screw worms, blow flies, and wool maggots which infest the wounds of animals, including cattle and sheep.

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NATIONAL COMMITTEE TO STUDY POST-WAR UTILIZATION OF NITROGEN

The total capacity for manufacture of synthetic nitrogen in the United States after the war will be more than twice as great as this country's maximum annual pre-war consumption of nitrogen for all purposes.

A United States Department of Commerce bulletin states that "ammonia as a fertilizer supplying nitrogen indispensable to the life processes is counted upon as a post-war outlet" for much of this greatly expanded capacity, and that "the amount of fertilizer chemicals that this new capacity will be able to supply farmers may possibly affect even the basic technology of crop production."

The problem of utilizing this unprecedented tonnage of nitrogen is to be studied by a newly organized National Joint Committee on Nitrogen Utilization of which Dr. R. M. Salter, Chief of the U. S. Bureau of Plant Industry, Beltsville, Md., is chairman.

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POULTRY REQUIRES FULL RATIONS TO MEET 1943 EGG AND MEAT QUOTAS

The American hen in 1942 produced over 50,000,000,000 eggs compared with 36,000,000,000 the year before -- and now new and increased quotas have been set for 1943.

Rapid growth, early maturity, and high egg production -- all essential to Secretary Wickard's proposed 8 per cent increase of eggs and 28 per cent increase of chicken meat -- must be achieved without sacrifice of vigor and general health of the flock. This means that to meet the government's quotas of at least 55,000,000,000 eggs and around 4,000,000,000 pounds of chicken meat, poultry must be properly cared for and fed full rations containing all necessary ingredients, including the required units of vitamin D.

"Delsterol" Helps Grow Chicks Free from Rickets

Adequate supplies of vitamin D, essential for rearing chicks free from rickets and for maintaining the health and productivity of laying and breeding stocks, are available in "Delsterol" "D"-activated animal sterol.

"Delsterol" in powder is manufactured by Du Pont from domestic raw materials. All factors of production are carefully standardized and controlled, resulting in a uniform product. This powdered carrier of vitamin D is finding favor among poultry-feed manufacturers because, among other advantages, it eliminates "off" taste and odors, does not congeal in cold weather, is highly concentrated, and has unusual dispersement qualities and stability.

The relationship of various abnormalities in poultry to a lack of vitamin D in the ration has been established by research. Science has shown the vital need for a reliable vitamin D supplement, such as the one now produced and marketed as "Delsterol," not only to insure satisfactory egg yields, but eggs with desirable hatching quality.

"Delsterol," evolved from a relatively new scientific principle of poultry nutrition, is based on the discovery that certain chemical compounds known as sterols can be transformed by ultra-violet light into vitamin D. Feeding these activated sterols results in proper use and deposition of calcium and phosphorus and in normal growth of chickens.

Use of "Delsterol," along with other necessary ingredients, in commercial feed will help insure a balanced ration, so that the American hen can reach the 1943 quotas.

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SPECIAL 3-8-7 VICTORY GARDEN FERTILIZER AUTHORIZED

Vegetables in the 12,000,000 urban and suburban and the 6,000,000 farm Victory Gardens to be grown in the United States should not go hungry for commercial plant food this spring and summer.

A special Victory Garden fertilizer has been authorized by the government to help grow more vegetables so that American housewives can greatly surpass their 1942 record of 1,320,000,000 jars of home-canned food -- enough to make a row of canned food running ten times around the earth at the equator.

To insure maximum yields of high-quality truck crops, a special 3-8-7 Victory Garden mixed fertilizer will be available for application to the soils of Victory Gardens which are defined as those "planted primarily for non-commercial production of vegetables and small fruits."

Farmers May Use Any Grade Purchased for Use On Other Crops

Only this special grade, which must be labeled "Victory Garden Fertilizer -- for Food Production Only" by the manufacturer, may be used on Victory Garden soils, except that the farmer may use on his Victory Garden any grade of fertilizer he may purchase for use on his commercial farm crops.

The special 3-8-7 may now be formulated with nitrogen derived from either or both organic sources such as animal, fish and other tankages, and chemical sources which include sulfate of ammonia, nitrate of soda, calcium cyanamid, "Uramon" fertilizer compound, and solutions such as Du Pont's urea-ammonia liquors. Oilseed meals may not be used in any fertilizer, including the special Victory Garden 3-8-7 mixture, manufactured for sale.

The original order prohibiting the use of fertilizers containing any chemical nitrogen whatsoever on lawns, parks, golf courses, cemeteries, roadsides, and non-commercial plantings of trees, shrubs, and flowers has not been amended.

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SMALL-ENVELOPE PACKAGES OF "SEMESAN" AVAILABLE FOR VICTORY GARDENS

Sufficient "Semesan" seed disinfectant for vegetables is available in small envelope packages to meet the needs for Victory Gardens throughout the country this year. Seed treatment for prevention and control of soil-borne and seed-borne diseases, such as seed decay and damping-off before and after emergence, generally assures better stands. "Semesan" is unusually effective when cold, wet soil conditions immediately follow planting, especially in early spring. A special Victory Garden leaflet on the use of this organic mercury compound, just off the press, will be sent on request to the editor of the "Agricultural News Letter."

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Agricultural News Letter (Du Pont)
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PAINTING "DO'S" AND "DON'TS"

Homes, barns, silos, granaries, workshops, bins, and other structures may be painted at any time of the year, provided the temperature is not lower than 40° Fahrenheit.

But, don't paint over a wet surface or during wet weather!

This "don't" is one of a number of painting "don'ts" developed by Du Pont research -- "don'ts" that are especially important in the wartime conservation program.

Surface Must Be Dry, Clean, and Free From Dust

Basing their recommendations on knowledge gained from long years of experience, together with thousands of tests on panels and actual buildings, Du Pont paint technologists not only insist that the surface be dry but also perfectly clean and free from dust.

Surface preparation is the first step in good painting, they state. No matter how good a paint may be or how well suited to its purpose, it cannot accomplish the desired results unless it is applied on a properly prepared surface. These paint experts recommend sanding glossy surfaces to dull the gloss and to improve adhesion; and removing dirt by brushing or scraping. They suggest eliminating dust by brushing with a painter's duster; cleaning off grease by washing with turpentine or, on floor and woodwork, by washing with soap and water followed by rinsing with clear warm water.

Among the Du Pont list of painting "don'ts" are:

Don't pile a number of paint coats, one on top of the other, since this practice tends to promote cracking of the paint film. It may be necessary to remove piled-up coats at intervals, so as to prepare the proper foundation for the new finish.

Don't apply paint too heavily. See that each coat is thoroughly brushed out.

Don't fail to stir the paint well before application. This means that all lumps or heavy portions are thoroughly mixed with the liquid paint vehicle.

Don't add lead-in-oil to a high-quality prepared paint to "make it heavier in body." The paint will be of proper consistency if pigment and vehicle are completely mixed.

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Permit Previous Coat to Dry Before Applying Another Coat

Don't apply succeeding coats without allowing sufficient time for previous coats to dry. It is better to allow too much than too little time.

Don't fail to follow directions, especially with regard to addition of thinners and the application of the material.

Don't fail carefully to remove skins from the top of a previously opened package of paint or enamel. Cut the skin from the edge of the can with a putty knife. Remove and destroy the skin. If it falls apart in small pieces, the only way to remove it is by straining the liquid portion in which the skins float before stirring. Don't attempt to break the skins up in the package by violent agitation. Small particles will cling to the brush, be transferred to the painted surface, and ruin the finish. It may be necessary to strain the entire contents if skins are stirred into it.

And --

Don't fail to paint surfaces often enough to prevent decay and deterioration. It is false economy to attempt to save money by failure to paint when painting should be done.

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WHAT 100 POUNDS OF SALVAGED FATS AND OILS CAN DO

The fats and oils derived from the livestock and vegetable crops grown on our farms, if saved in the kitchens of America, can play a very important part in winning the war.

One hundred pounds of scrap fats and oils can be converted into more than 6 pounds of glycerin, then to nearly 15 pounds of nitroglycerin. The 15 pounds of nitroglycerin, used in blasting dynamites, will make enough dynamite to bring down 1,500 tons of soft coal or sufficient iron ore to provide steel to make 2,000 hundred-pound bombs.

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CALIFORNIA STATION REPORTS ON EXPERIMENTS WITH PHENOTHIAZINE

PHENOTHIAZINE-SALT MIXTURE CONTROLS STOMACH WORMS IN SHEEP ON PASTURE

Mass treatment with phenothiazine mixed with ordinary salt, instead of individual dosing with tetrachlorethylene or copper sulfate and nicotine sulfate, will control stomach worms in sheep grazing on pasture, according to a statement issued by the University of California.

The research on which this report is based was conducted by J. W. Britton, R. F. Miller, and H. S. Cameron at the Agricultural Experiment Station at Davis. They point out that since a quarter of a million lambs are fed on Ladino clover pastures in California alone, the saving in labor and other costs will be quite large. Furthermore, they say, the drugs formerly used require starving the animals before and after treatment, greatly retarding their gains. The statement continues:

"Before trying mass administration of phenothiazine, tests were run to determine that the drug given with salt would not be toxic. This having been proved, phenothiazine was mixed with half-ground salt, about one part to fifteen, and the lambs were given free access to the mixture. Six hundred lambs were tried first, then 150 ewes, and next 80 ewes in bad condition. All tests were successful in controlling the stomach worms."

The experimenters have 2,400 more lambs under test, alternating five weeks on the phenothiazine-salt mixture at the rate of a half ounce of phenothiazine per animal per month and five weeks on block salt. They hope no other means of control will be necessary.

REPEATED SMALL DOSES OF PHENOTHIAZINE CONTROL STRONGYLES IN HORSES

Results of research conducted by the Agricultural Experiment Station in California not only confirm previous findings regarding the efficiency of phenothiazine for control of the internal parasite of horses known as strongyles, but in addition develop new facts concerning dosage and mode of administering.

Given in small doses in the feed of horses at the University of California's W. K. Kellogg Arabian Horse Ranch, Pomona, Calif., phenothiazine provided excellent control, according to C. E. Howell and J. W. Britton of the Davis branch station.

Continued on next page

They report that they also obtained satisfactory results with colts suffering from rickets, moderately anemic horses, mares in the last month of pregnancy, and lactating mares suckling foals -- with no ill effects from the drug. Doses of from 25 to 30 grams were found adequate for horses of average size (around 1,000 pounds).

Howell and Britton also found that under southern California conditions, treatment appears to be necessary in early spring and late summer. The investigators found it unwise to worm foals under nine months of age, unless small stomach worms were present. Small repeated daily doses of 1 to 5 grams of phenothiazine, given until therapeutic dose of 25 to 30 grams was reached, were found effective, and when given with a tonic are probably more satisfactory than single large doses.

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PLASTIC BEARINGS SELF-LUBRICATED WITH FRUIT JUICE

Large rotary fruit-juice extractors, capable of turning out 200 gallons of citrus juice per hour, now depend on self-lubricating bearings of "Lucite" methyl methacrylate resin to keep going in wartime.

Faced with a shortage of bronze bearings, one machinery manufacturer, after several months of exhaustive trials with new materials, found that in addition to outwearing other types several times, bearings fabricated of "Lucite" were actually lubricated by contact with citrus juices and periodic steam baths -- two things that always shortened the life of bronze bearings.

Du Pont chemists have been advised that the new bearings are equally resistant to orange, grapefruit, and lemon juices. "Lucite" is now on high priority -- available for only the most essential uses.

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Agricultural News Letter (Du Pont)
Vol. 11, No. 2 March-April, 1943

FARM HOMES OF TOMORROW WILL BE SAFER

A few quarts of fire-retardant solution applied to kitchen curtains, aprons, and other clothing and house furnishings will make the farm family safer.

The same fire retardants, some of which are now available for war uses only, will help avert farmhouse fires, often more treacherous because of distance from fire stations.

Busy farm women who must leave small children in the home while they do chores out of doors need worry less if the children's clothing has been treated to prevent flames.

The homemaker herself can treat washable furnishings and garments as easily as she starches them now. The only difference is that laundered garments must be dried before they are dipped in the chemical solution which makes them resistant to flame. Fire applied to the treated cloth will slowly char it, but the cloth will not blaze.

Fire Retardant Based on Ammonium Sulfamate

One fire retardant developed recently by the Du Pont Company is unique because it leaves treated materials unchanged in appearance and feel. This Fire-Retardant "CM," regarded as one of the best for household purposes, is based on ammonium sulfamate (not to be confused with ammonium sulfate) and has the advantage of preventing dangerous afterglow. It comes in the form of white crystals that are odorless and non-toxic.

Besides washables, "CM" protects rugs, upholstery, draperies and bedding. It may be sprayed on these heavier fabrics and remains effective after dry-cleaning but must be replaced following laundering.

"Du Pont fire retardants, now produced by tons, are serving vital war purposes to prevent waste of lives. The homemaker will need to practice extreme watchfulness for the duration, but after the war increased use of fire retardants will help make the rural home safer with less mental anxiety," according to Gertrude Dieken, Du Pont home economics consultant.

Meanwhile, a solution which will flame-proof cloth may be made by stirring 7 ounces of borax and 3 ounces of boric acid into 2 quarts of hot water. If powdered boric acid is used, it can be more readily dissolved by first adding a small amount of water to make a paste. If the solution becomes cloudy or thick upon standing, warming will restore it.

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TETRAMETHYL THIURAMDISULFIDE AS A VEGETABLE SEED TREATMENT

By Gilbert F. Miles, Manager,
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The war emergency and the consequent shortage of many metals has stimulated interest among plant pathologists in the use of non-metallic compounds as seed treatments. The search for such chemicals, however, is not solely the result of the present emergency; it has been carried on systematically and continuously for many years by commercial firms and others interested in the development of more effective and more economical fungicides.

The commercial development of treatments for vegetable seeds involves certain restrictions which make the problem more difficult in some respects than in the case of fungicides for use on large-acreage crops like cotton and cereals. For example, it would probably be economically impracticable to develop, manufacture, and market a separate seed treatment for each sort of vegetable seed or even for each of several groups of vegetable seeds. To provide a potential volume of sales necessary for the large-scale and hence more economical manufacturing and marketing operations, it appears almost necessary to develop a single product useful on all or nearly all vegetable seeds.

The popularity and widespread acceptance of chlorophenol mercury, marketed under the trade-mark "Semesan" for nearly 20 years, is accounted for in part by the fact that the product is applicable to nearly all kinds of vegetable and flower seeds. During that time compounds of other metals such as copper and zinc have been tried as vegetable seed treatments and have proved very effective on some seeds but ineffective or even highly injurious to others. Since this specificity in fungicidal and phytotoxic behavior is found quite generally in organic and inorganic metallic and non-metallic compounds alike, a compound which is in general high in fungicidal and low in phytotoxic value, is unusual and worthy of attention.

Investigations involving both biological and chemical researches over a period of several years now provide considerable assurance that an organic sulfur compound, tetramethyl thiuramdisulfide, is generally superior as a vegetable seed treatment to many of the metallic compounds now used for that purpose. Furthermore, tests on seeds other than vegetable indicate this organic sulfur compound has a wide range of possibilities as a disinfectant and protectant for such crop seeds as soybean, peanut*, cowpea, velvet bean, and the grasses.

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*See "Agricultural News Letter," Vol. 10, No. 5, p.114, Sept.-Oct., 1942, for report on results of experiments with peanuts.

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Now Available Under Trade-Mark "Arasan"

Combined with suitable adjuvants, tetramethyl thiuramdisulfide is now available under the trade-mark "Arasan" as a non-wettable, finely divided powder which adheres well to seed. The trade-mark "Arasan" was adopted to differentiate the material in the consumer's mind from "Thiosan," which is a wettable powder also containing tetramethyl thiuramdisulfide as the active ingredient.** "Arasan" has little or no odor. Individuals allergic to sulfur may develop skin irritations from contact with undue amounts of the dust.

Agar plate tests provide evidence of the effectiveness of "Arasan" against many seed-borne organisms. For example, seeds of kale, tomato, watermelon, cucumber, and cantaloupe treated with 1 part of "Arasan" to 400 parts of seed by weight showed only 3 per cent of the seeds with bacterial or fungous colonies as compared with 89.8 per cent for untreated seeds. The metallic seed treatments applied at the much heavier recommended dosages of 1:40 and 1:240 permitted bacterial or fungous growth on 11.8 to 66.2 per cent of the seeds. These results, typical of those obtained in repeated tests with seeds of all of the commonly grown vegetables, indicate the relatively high order of fungicidal effectiveness of the organic sulfur compound.

Plantings in soil infested with damping-off organisms have demonstrated the value of "Arasan" as a protectant against pre-emergence and post-emergence damping-off by both Rhizoctonia and Pythium. For example, eleven sorts of vegetable seeds were treated with "Arasan" at suitable dosages ranging from 1:200 to 1:1600 and planted in soils held in temperature-control tanks at 60, 70, and 80°F., respectively, for the first three days and then transferred to the greenhouse (70°F.). Other lots of the same seeds treated with metallic seed treatments were included in the test.

The average final stand of seedlings from the "Arasan" treated seed of the 80° lot was 24.4 per cent better than for the untreated seed. In the same test the increases for the metallic seed treatments ranged from 4.3 to 12.3 per cent.

The corresponding figures for the seed started at 70° were 44.6 per cent for "Arasan" and 11.3 to 32.5 for the metallic treatments.

For the 60° lot of seed the organic sulfur produced an average increase in stand of 56.5 per cent compared with 30.0 to 42.6 per cent for the metallic compounds.

It would appear from these and similar data that the new product promises to combine good seed protectant properties with high seed disinfectant values.

While the foregoing figures have been obtained repeatedly at dosages of only 10 to 50 per cent of those usually recommended for certain metallic compounds, the high degree to which tetramethyl thiuramdisulfide is tolerated by most seeds provides "Arasan" with a wide margin of safety. In most cases the minimum effective dosages range from 1:400 down to 1:800, but applications as heavy as 1:100 cause no serious injury in the case of most, but not all, vegetable seeds.

From the results thus far obtained it seems likely that "Arasan" may provide vegetable growers with a product which is in general very effective and economical.

**See "Agricultural News Letter," Vol. 10, No. 2, p.27, March-April, 1942, for report on results of use of "Thiosan" for control of brown patch and dollar spot on bent grasses.